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A4S SX7
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GB 1522828 A GB 0868452 A

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INT CL^6 A47G 25/54 25/56 25/58 , B31B 19/14 23/00 37/00 , B65D 85/18
ONLINE:EPODOC, WPI

(54) Abstract Title
Hanging garment bag formed from tubular extrusion

(57) A transit bag 10 for a hanging garment 12 comprises a tubular extrusion of polyethylene having a garment ingress 14 in the form of a slit parallel to the extrusion direction 16 and extending substantially from top 18 to bottom 20 of the bag. The latter has side gussets in one of which is the slit ingress 14 and also a selfadhesive strip 26 to seal the ingress. The bag 10 is thinner in the region of the strip 26 than at the opposite side 25 of the bag in order to compensate for the thickness of strip 26 when the bag is wound onto a storage roll. These features allow continuous forming of the slit ingress 14 and application of the strip 26 as the tubing is being extruded. This makes for very cheap and convenient manufacture of the bag 10, which can be used for home delivery of mail order items as hanging garments to cheapen and improve the delivery. The bag is sealed by welding at its bottom 20 and top 18, the latter having a small opening 21 for hook 34 of hanger 11.

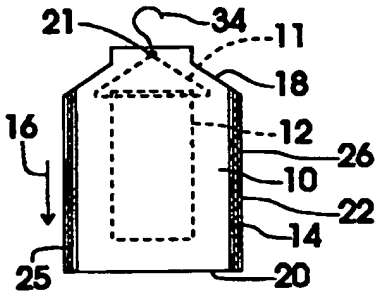

FIG. 1

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

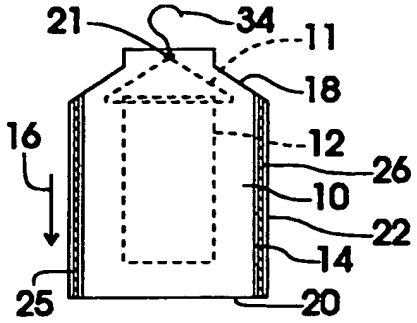

FIG. 1

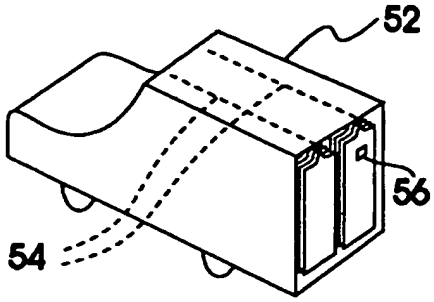

FIG. 4

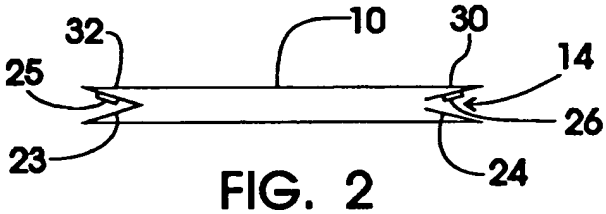

FIG. 2

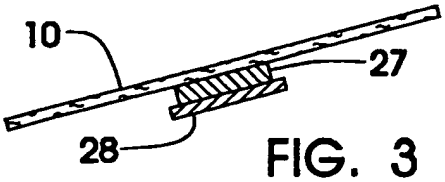

FIG. 3

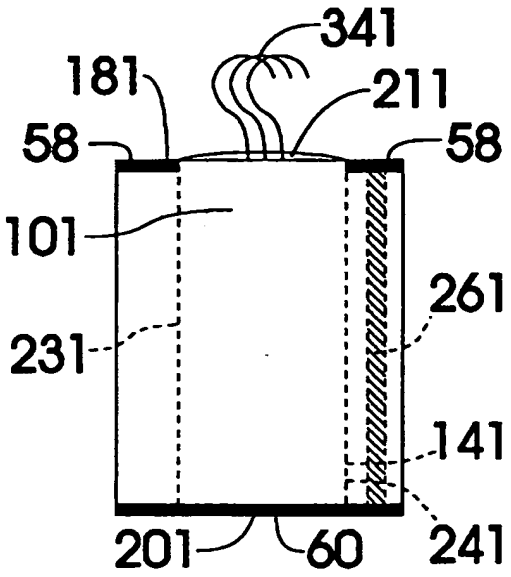

FIG. 6

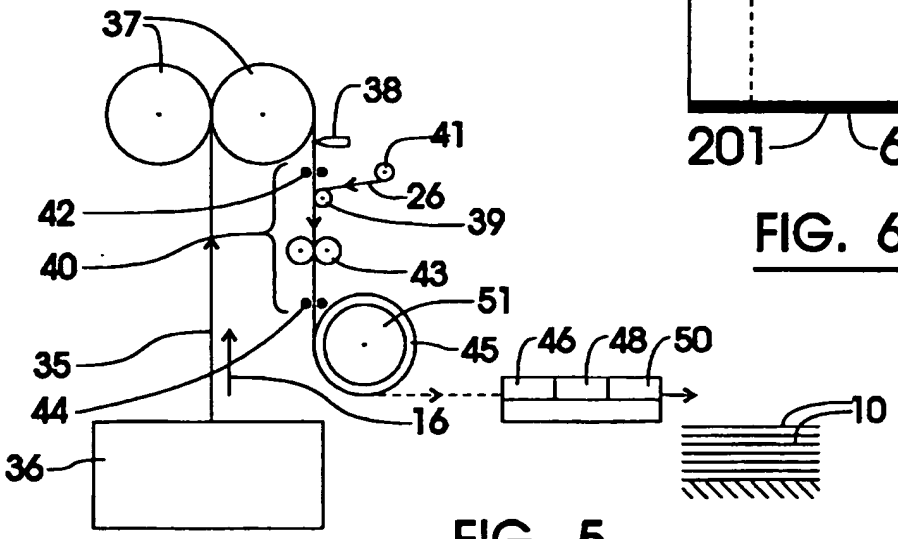

FIG. 5

"PACKAGING"

FIELD OF THE INVENTION

This invention relates to packaging, including packaging articles, materials for making such articles, methods and apparatus for making these, methods of packaging and methods of transport.

BACKGROUND TO THE INVENTION

Up to now, the processing of a hanging garment, e.g. coat, dress, suit, top, skirt, jacket, trousers or the like, after its manufacture comprised the following steps. The manufacturer placed the garment on its hanger into an extruded bag through the open bottom of the bag with the hook of the hanger projecting out of the top of the bag. This was a flimsy bag and simply served as a dust cover during transport to the distributor and while stored at the distributor's warehouse until it was ordered by a customer. A proportion of such garments would be subjected to inspection for quality control. At the stage of quality control and/or despatching the garment, the bag would be taken off and destroyed and the garment would be packed in tissue paper and then in a cardboard box and sent, through the postal services or by courier, to the home buyer. The packaging was intended to keep the garment in good condition from the premises of the distributor to the home buyer and enable good presentation. The whole procedure and materials were very expensive, time-consuming and labour-intensive.

THE INVENTION

According to one aspect of the invention there is provided a hanging garment bag as claimed in claim 1. The present inventor realised, in particular, that in the

prior art the insertion of the garment from the bottom of the bag was very fiddly and time-consuming, the insertion required the hand holding the garment hanger to be inserted the whole height of the bag, the garment tended to catch on the edge of the bag and snag the bag, and the bag had afterwards to be pulled down around the garment. The features of claim 1 and particularly the direction of the ingress allow the garment to be inserted into the bag sideways (apart from threading the hanger hook or other support means through an opening in the top of the bag). This was found to be much easier and quicker, the hand had only to be inserted into the usually much smaller width than length of the bag and then only halfway across if (as usual) holding the hanger hook, possibly because of the larger opening the garment was found much less likely to catch on the edge of the bag and snag the bag (this was even further improved by the features of claim 5), and it was found much easier to pull the bottom of the bag over the bottom of the garment than to pull the bag down around the garment. The speed of the whole process of loading the garment into the bag was found to be improved by a factor of at least 3. The features of any of claims 2 to 5 allow the bag to be made and used very cheaply and conveniently. The features of claim 6 enable the bag to be sealed readily and the features of any of claims 6 to 11 then allow the bag to be used and manufactured more cheaply and easily. In particular, some of these features (especially those of any of claims 2, 3, 9 and 10) enable the bag to be made in a continuous process, which can reduce the cost of packaging for home delivery by a factor of e.g. 5. The features of any of claims 4, 5, 8 and 11 facilitate ready storage and use of the bags, and of claim 7 security (since tampering with the package will be clearly apparent from damage to the bag), cleanliness (preventing ingress of dust, grime or the like, e.g. dirt) and good

presentation for home delivery. The bag can possibly be used for transit from manufacturer to distributor in the unsealed condition if its form has sufficient overlap by gusset means or otherwise to exclude dust, grime or the like to the desired degree in these particular circumstances. Alternatively, the seal can be effected by a resealable adhesive so that the bag can be opened by the distributor for quality control inspection. Again, the garment can first be placed in the bag just prior to transport to the home buyer. The bag lends itself to being made of heavy duty material which can adequately protect the garment for home delivery. The features of any of claims 13 and 14 allow the bag to be made particularly suitable for home delivery. During such delivery the bag will have the features of claim 17. The feature of claim 13 of making the bag opaque (e.g. by adding pigment, white or coloured, to the low-density polyethylene before extrusion) adds to the security of the package in transit since the garment inside is not visible and is considered therefore to present less temptation to e.g. a potential thief. The small opening of claim 14, if it is a slot, preferably with adjacent edges, is then considered to give the significant reduction with a length of maximum 5 centimetres but preferably maximum 2½ centimetres, with a much more significant reduction with maximum 1½ centimetres. If the slot is vertical or sloped, it is much easier (and quicker, surer and less damaging to the bag) to push the hook or like device out therethrough (by avoiding or minimising twisting of the bag material to enable this action), as also if the slot is spaced from the top of the bag to accommodate e.g. the height of that part of the hook above its point. The feature of claim 15 guides the hook or like device towards the slot to facilitate loading of the garment into the bag.

Turning to the manufacture of the bags, they can be provided in two stages, one of which produces extruded polyethylene tubing in large lengths wound into storage rolls, for which purpose the feature of claim 12 adapts the bag particularly for this method of storage, the thinning of the polyethylene being arranged to compensate for the thickening due to the sealing strip. The second stage of the process is then to take the tubing from the storage roll and divide it into individual bag lengths, heat sealed at top and bottom to form the bags, taking into account any required shaping, e.g. at the top.

Another aspect of the invention provides extruded polyethylene tubing as claimed in claim 20. For the reasons given above, it can be particularly advantageous to have the features of any of claims 21 and 22. Similarly, according to another aspect of the invention there is provided extruded polyethylene tubing as claimed in claim 23.

Consonant with the foregoing, according to another aspect of the invention, there is provided a method of manufacturing tubing as claimed in claim 26, preferably having the features of any of claims 27 to 29. Building on this, and according to another aspect of the invention, there is provided a method of manufacturing a bag as claimed in claim 32, preferably having the features of any of claims 33 to 36.

Corresponding to the above, according to other aspects of the invention there can be provided: apparatus for manufacturing tubing as claimed in claim 39, preferably with the features of any of claims 40 and 41; apparatus for manufacturing a bag as claimed in claim 44, preferably with the features of any of claims 45 to 48; a method of packaging a hanging garment as claimed in claim 51, preferably with the features of claim 52; a method of transporting hanging garments as claimed in claim

55, preferably with the features of claim 56; a vehicle as claimed in claim 59; and a hanging garment as claimed in claim 62. The latter will have advantages of cheapness and quality of presentation (e.g. lack of creasing) due to use of the invention.

There can be provided the features of claims 16, 35 and 47, with the advantages hereinafter described.

DESCRIPTION OF DRAWINGS

Reference will now be made by way of example to the accompanying drawings in which:-

Figure 1 is a front elevation of a bag embodying the invention;

Figure 2 is a cross-section on the line 2-2 in Figure 1;

Figure 3 is a detail of Figure 2;

Figure 4 is a diagrammatic side elevation of apparatus for manufacturing the bags;

Figure 5 is a diagrammatic perspective view of a vehicle for transporting the garments in the bags; and

Figure 6 corresponds to Figure 1 but shows a modification.

Referring to the drawings, reference numerals with the same first two digits indicate items having the same or like functions.

A bag 10, Figure 1, for transit of a garment 12 hanging on a hanger 11, comprises a tubular extrusion of polyethylene having a garment ingress 14 extending in the extrusion direction 16. The ingress 14 is in the form of a slit parallel to the extrusion direction and extends substantially from the top 18 to the bottom 20 of the bag 10. Before the garment 12 is inserted in it, the bag 10 is substantially flat and the ingress 14 is at or near one side 22 of the bag 10. The bag has side gussets 23, 24 and the ingress 14 is in the gusset 24. Typically, the bag may be 70 centimetres wide

and 95 centimetres high, with gussets 23, 24 being 6 centimetres wide. The bag 10 has a self-adhesive strip 26 to seal the ingress 14, the strip comprising self-adhesive material 27 suitable to effect a permanent seal to the polyethylene and a non-adhesive backing layer 28 that can be peeled off to expose the adhesive 27. The strip 26, including layer 28 and material 27, may have a total thickness of about 10 microns. The strip 26 lies parallel to the extrusion direction and extends substantially from top 18 to bottom 20 of the bag. Like the ingress 14, the strip 26 is in said gusset 24. The extruded polyethylene is thinner in the region 30 of the strip 26 than at the opposite side 32 of the bag 10. This may be effected by actually making the polyethylene thinner in region 30, or preferably by making bag 10 thicker at its opposite side 32, e.g. by a band 25 of thickening being part of the extrusion and having the same extent and thickness as strip 26. The polyethylene is low-density and it is coloured to make it more solid and more opaque. The bag 10 is sealed completely across its top 18 and is then provided in the region of the sealed top 18 of the bag 10 with a small opening 21, e.g. a slot ½ to 1½ centimetres long, preferably about 1 centimetre long, to allow a hook 34 or other garment suspension device of hanger 11 to be pushed through opening 21 (to extend therethrough) which is made sufficiently small to reduce significantly the amount of dust, grime or the like that can enter therethrough, e.g. because polyethylene readily produces static that attracts dust or grime. A static-reducing ingredient can be added to the polyethylene. To avoid the usual danger of suffocation, without facilitating the entry of dust, grime or the like, the material, e.g. when it is tubing, may be provided with microperforations, e.g. by using a spiked roller. The bag 10 is shaped (with the sloping shoulders seen in Figure 1) at the top 18 towards said small opening 21 to facilitate the loading of the garment 12 into bag

10 by guiding the hook 34 towards the opening 21 as the garment 12 is being placed into the bag. After this, said ingress 14 is sealed by pealing off backing 28 and pressing together the facing sides of gusset 24.

Apparatus for manufacturing extruded polyethylene tubing for making into bags 10 comprises an extruder 36, Figure 5, suitable for extruding polyethylene tubing 35, pinch rollers 37, of diameter about 20 centimetres and located about 5 metres above extruder 36 to draw the extruded tubing 35 from extruder 36, means 38 for continuously forming a slit in the tubing 35 which may simply comprise a knife edge, and means 40 for continuously applying self-adhesive strip 26 from a supply roll 41, over a guide roller 39 and between compression rollers 43 located between a pair of lifting fingers 42 for raising one side of the gusset 24 clear of the other side thereof to allow strip 26 to be applied to said other side and fingers 44 to bring the two sides of gusset 24 together again after strip 26 has been applied, fingers 42 being separated from fingers 44 by a spacing of perhaps 90 centimetres and the strip 26 being some 1 centimetre in width and applied some 2½ to 4 centimetres from the edge of tubing 35, before this is wound onto storage roll 51. Means 40 comprises the rollers 39, 43 and fingers 42, 44. The thinning in the region 30 compensates for the added thickness of strip 26 so that tubing 35 winds evenly onto roll 51. When a suitable quantity, e.g. 1,000 metres, has been wound onto a cardboard former 45 on roll 51, the former 45 and its load of tubing 35 is removed and the winding continues onto a fresh former 45 placed on roll 51.

Apparatus for manufacturing a bag 10 comprises means 46 to sever into suitable lengths the tubing 35 taken off a former 45 and to weld such lengths closed at the top 18 and bottom 20. The apparatus may further comprise means 48 to shape

the bag at the top 18 to the shape seen in Figure 1 and preferably means 50 to provide a small opening in the region of the sealed top 18. The means 46, 48 may comprise heat-sealing wire for shaping, cutting and sealing the bag at top 18 and bottom 20, waste pieces from the shaping being removed by vacuum means and the individual bags 10 being piled after means 50 also by vacuum means, any suitable vacuum means for positioning and moving being included in means 48, 49, 50.

Such apparatus may further comprise the apparatus 36 to 44 for manufacturing the tubing 35 as just previously described and, e.g. if extrusion is matched to orders, the storage roll 51 and former 45 may be omitted and the tubing 35 fed direct to the bag manufacturing means 46, 48, 50.

The (unthickened) polyethylene may conveniently be in the range 30 to 65 microns thick, preferably 40 to 45 microns, more preferably about 40 microns.

By use of the bags, packaging in tissue paper and boxes can be omitted, particularly if the bags are made sufficiently robust and the delivery system is adapted to delivery of hanging bags, as by use of a vehicle 52 specially adapted, e.g. by means of rails 54, and suitable labelling 56 on the bags. This allows more garments to be delivered per van load, better presentation of the garments, less creasing of the garments, it is cheaper, less labour-intensive, uses less raw material, there is less wastage and the materials can be 100% recyclable.

Further economy (and less wastage when scrapping the bags) can be obtained for some distribution systems by designing the bag 101, Figure 6, so that a single bag 101 can take a plurality of hangers carrying respective garments, suits or so on. Their hooks 341 can project through an unwelded opening 211 in the top 181 that is elsewhere welded and cut straight across the bag 101. The formation of part welds

58 at the top and a weld 60 the full width of the bag 101 at the adjacent bottom of the next bag (not shown), e.g. in a single welding operation, in production from continuous extrusion, followed by cutting to separate the bags, is known in the art as "interrupted welding". The gussets 231 and 241 are made deeper than in the Figure 1 embodiment so that the bag 101 can expand sufficiently to take the larger number of garments.

The bag 10 or 101 may be made transparent, or tinted, so that the garments delivered to the wholesaler or retailer can, without being taken out of the bag, be seen clearly by a prospective purchaser.

It will be apparent to one skilled in the art, that features of the different embodiments disclosed herein may be omitted, selected, combined or exchanged and the invention is considered to extend to any new and inventive combination thus formed, e.g. the bag not being of polyethylene.

CLAIMS

1. A hanging garment bag, characterised in that it comprises a tubular extrusion of polyethylene having a garment ingress extending in the extrusion direction.

2. A bag as claimed in claim 1, characterised in that said ingress is in the form of a slit parallel to the extrusion direction.

3. A bag as claimed in claim 1 or 2, characterised in that the ingress extends substantially from the top to the bottom of the bag.

4. A bag as claimed in any one of claims 1 to 3, characterised in that the bag is substantially flat and the ingress is at or near one side of the bag.

5. A bag as claimed in claim 1 or 4, characterised in that the bag has at least one side gusset and the ingress is in said gusset.

6. A bag as claimed in any one of claims 1 to 5, characterised in that the bag has a self-adhesive strip to seal said ingress.

7. A bag as claimed in claim 6, characterised in that the strip comprises a self-adhesive material suitable to effect a permanent seal to the polyethylene.

8. A bag as claimed in claim 6 or 7, characterised in that the strip has a non-adhesive backing layer that can be peeled off to expose the adhesive.

9. A bag as claimed in any one of claims 6 to 8, characterised in that the strip lies parallel to the extrusion direction.

10. A bag as claimed in any one of claims 6 to 9, characterised in that the strip extends substantially from top to bottom of the bag.

11. A bag as claimed in any one of claims 6 to 10, characterised in that the bag has at least one side gusset and said ingress and strip are in said gusset.

12. A bag as claimed in any one of claims 6 to 11, characterised in that the extruded polyethylene is thinner in the region of the strip than at the opposite side of the bag.

13. A bag as claimed in any one of claims 1 to 12, characterised in that the polyethylene is low-density and opaque.

14. A bag as claimed in any one of claims 1 to 13, characterised in that the bag is sealed completely across the top and is provided in the region of the sealed top of the bag with a small opening to allow a hook or other garment hanger suspension device to extend therethrough, said opening being sufficiently small to reduce significantly the amount of dust, grime or the like that can enter therethrough.

15. A bag as claimed in claim 14, characterised in that it is shaped at the top to lead towards said small opening.

16. A bag as claimed in any one of claims 1 to 13, characterised in that the bag is sealed across part of the top by interrupted welding to leave an opening in the course of the top sealing.

17. A bag as claimed in any one of claims 1 to 16, characterised in that said ingress is sealed resealably or permanently.

18. A hanging garment bag, substantially according to any embodiment hereinbefore described.

19. A hanging garment bag, substantially according to any embodiment hereinbefore described with reference to and illustrated in the accompanying drawings.

20. Extruded polyethylene tubing for making into bags as claimed in any one of claims 1 to 17, characterised in that it comprises a slit in the extrusion direction.

21. Tubing as claimed in claim 20, characterised in that it comprises a self-adhesive strip to seal the slit.

22. Tubing as claimed in claim 20 or 21, characterised in that it is thinner in the region of the strip than at the opposite side of the bag.

23. Extruded polyethylene tubing for making into bags as claimed in any one of claims 1 to 17, characterised in that the tubing is thinner at one part of its cross-section than at an opposite part.

24. Extruded polyethylene tubing for making into bags and substantially according to any example hereinbefore described.

25. Extruded polyethylene tubing for making into bags and substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

26. A method of manufacturing tubing as claimed in any one of claims 20 to 23, characterised in that it comprises extruding polyethylene into tubing and continuously forming a slit in the tubing in the extrusion direction.

27. A method as claimed in claim 26, characterised in that it comprises continuously applying to the tubing a self-adhesive strip in the extrusion direction able to be used for sealing said slit.

28. A method as claimed in claim 26 or 27, characterised in that it comprises making the extruded tubing thinner in the region of the strip than at an opposite part of the tubing.

29. A method as claimed in any one of claims 26 to 28, characterised in that it comprises continuously forming a gusset in the tubing in the extrusion direction with said slit and/or as the case may be said strip in said gusset.

30. A method of manufacturing tubing, substantially according to any example hereinbefore described.

31. A method of manufacturing tubing, substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

32. A method of manufacturing a bag as claimed in any one of claims 1 to 15 or 17, characterised in that it comprises severing into suitable lengths tubing as claimed in any one of claims 20 to 23 in combination with welding so that such lengths are closed at the top and bottom.

33. A method as claimed in claim 32, characterised in that it comprises providing in the region of the sealed top of the bag a small opening to allow a hook or other garment hanger suspension device to be pushed therethrough, said opening being sufficiently small to reduce significantly the amount of dust, grime or the like that can enter therethrough.

34. A method as claimed in claim 33, characterised in that it comprises shaping the bag at the top to lead towards said small opening.

35. A method of manufacturing a bag as claimed in claim 16, characterised in that it comprises severing into suitable lengths tubing as claimed in any one of claims 20 to 23 in combination with welding so that such lengths are closed at the bottom and partly closed by interrupted welding at the top.

36. A method as claimed in any one of claims 32 to 35, characterised in that it comprises a method of manufacturing tubing as claimed in any one of claims 26 to 29.

37. A method of manufacturing a bag, substantially according to any example hereinbefore described.

38. A method of manufacturing a bag, substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

39. Apparatus for manufacturing tubing as claimed in any one of claims 20 to 23, characterised in that it comprises an extruder suitable for extruding polyethylene tubing, and means for continuously forming a slit in the extruded tubing.

40. Apparatus as claimed in claim 39, characterised in that it comprises means for continuously applying a self-adhesive strip to the tubing able to be used to seal the slit.

41. Apparatus as claimed in claim 39 or 40, characterised in that the extruder is adapted to form the tubing thinner at one part of its cross section than at an opposite part.

42. Apparatus for manufacturing tubing and substantially according to any example hereinbefore described.

43. Apparatus for manufacturing tubing and substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

44. Apparatus for manufacturing a bag as claimed in any one of claims 1 to 15 or 17, characterised in that it comprises means to sever into suitable lengths tubing as claimed in any one of claims 20 to 23 in combination with welding so that such lengths are closed at the top and bottom.

45. Apparatus as claimed in claim 44, characterised in that it comprises means to shape the bag at the top.

46. Apparatus as claimed in claim 44 or 45, characterised in that it comprises means to provide a small opening in the region of the sealed top of the bag.

47. Apparatus for manufacturing a bag as claimed in claim 16, characterised in that it comprises means to sever into suitable lengths tubing as claimed in any one of claims 20 to 23 in combination with welding so that such lengths are closed at the bottom and partly closed by interrupted welding at the top.

48. Apparatus as claimed in any one of claims 44 to 46, characterised in that it comprises apparatus as claimed in any one of claims 39 to 41.

49. Apparatus for manufacturing a bag, substantially according to any example hereinbefore described.

50. Apparatus for manufacturing a bag, substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

51. A method of packaging a hanging garment, characterised in that the garment on its hanger is inserted sideways into a bag as claimed in any one of claims 1 to 17.

52. A method as claimed in claim 51, characterised in that the bag has a sealing strip for the ingress and this is thereby sealed.

53. A method of packaging a hanging garment, substantially according to any example hereinbefore described.

54. A method of packaging a hanging garment, substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

55. A method of transporting hanging garments, characterised in that the garments, packaged as claimed in claim 51 or claim 52, are hung on a rail in a vehicle and then transported in the vehicle.

56. A method as claimed in claim 55, characterised in that the vehicle is used for home delivery of the garments.

57. A method of transporting hanging garments, substantially according to any example hereinbefore described.

58. A method of transporting hanging garments, substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

59. A vehicle for transit of goods to home buyers, characterised in that it comprises a load of garments hanging in bags as claimed in any one of claims 1 to 17.

60. A vehicle for transit of goods to home buyers, comprising a load of garments hanging in bags and substantially according to any example hereinbefore described.

61. A vehicle for transit of goods to home buyers comprising a load of garments hanging in bags and substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

62. A hanging garment in a bag, provided with the aid of a bag, tubing, method, apparatus or vehicle as claimed in any preceding claim.

63. A hanging garment in a bag and substantially according to any example hereinbefore described.

64. A hanging garment in a bag and substantially according to any example hereinbefore described with reference to and illustrated in the accompanying drawings.

The Patent Office

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INVESTOR IN PEOPLE

Application No:	GB 9801050.7	**Examiner:**	Stephen Smith
Claims searched:	1-19, 32-36, 51, 52, 55, 56, 59 & 62	**Date of search:**	9 April 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): A4S(SX7), B8K(KAB, KAC, KXX)

Int Cl (Ed.6): A47G 25/54, 25/56, 25/58; B31B 19/14, 23/00, 37/00; B65D 85/18

Other: ONLINE:EPODOC, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X, Y	GB 1522828	(HYDORN) lines 30-54 of page 4; line 113 of page 4 to line 43 of page 5	X:1-4, 6, 9, 10, 13, 17, 32, 36, 51, 52, 62 Y:5, 11, 14-16, 33-35
Y	GB 868452	(NATIONAL DISTILLERS) lines 22-38 of page 1	5, 11, 14-16, 33-35

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.